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FOURTEENTH
BIENNIAL REPORT

of the

Montana

State Board *of* Health

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For the Years

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State Board *of* Health



For the Years

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STATE OF MONTANA

Department of Public Health

George M. Jennings, M. D., President.....Missoula
E. M. Porter, M. D., Vice President.....Great Falls
E. G. Balsam, M. D.....Billings
L. H. Fligman, M. D.....Helena
B. L. Pampel, M. D.....Livingston
W. F. Cogswell, M. D., Secretary and Executive Officer.....Helena

Division of Communicable Disease

J. H. Crouch, M. D., Director.....Helena

Division of Child Welfare

Hazel Dell Bonness, M. D., Director.....Helena
Mrs. Ann K. Waring, Field Nurse.....Acton
Miss Margaret Thomas, Field Nurse.....Missoula

Bureau of Vital Statistics

W. F. Cogswell, M. D., State Registrar.....Helena
L. L. Benepe, Deputy State Registrar.....Helena

Division of Water and Sewage

W. M. Cobleigh, Consultant.....Bozeman
H. B. Foote, Director.....Helena
Jacob Forbes, Assistant.....Helena

Hygienic Laboratory

Fred Stimpert, Director.....Helena
Miss Edith Kuhns, Assistant.....Helena

Division of Food and Drugs

W. M. Cobleigh, Consultant.....Bozeman
Glenn D. Wiles, Director.....Helena

STATE OF MONTANA
DEPARTMENT OF PUBLIC HEALTH

—[8]—

Helena, December 1, 1928.

Hon. John E. Erickson, Governor,
Helena, Montana.

Sir:

In compliance with Section 2447, Revised Codes of Montana 1921, I herewith hand you the fourteenth biennial report of the State Board of Health. In doing so I wish to thank you most heartily for your continued support in all public health work.

Yours very truly,

W. F. COGSWELL, M. D.,
Secretary.

ORGANIZATION

The State Board of Health is composed of five members, all of whom are physicians. The members hold office for five years, one being appointed each year by the Governor from a list of five selected by the Montana Medical Association. The Board was reorganized in 1919 and there has been but one change in personnel since that time. The names of the members of this Board will be found on the first page of this report. The Secretary is not a member of the Board.

In order to facilitate the work there have been organized the following divisions: Administration, Communicable Disease, Child Welfare, Vital Statistics, Water and Sewage, Hygienic Laboratory, and Food and Drugs. The Secretary is in charge of the Division of Administration.

The Division of Communicable Disease is in charge of Dr. J. H. Crouch, whose official title is Epidemiologist. Doctor Crouch had charge of a full-time health unit in Virginia, then took a course at the Johns Hopkins School of Public Health, after which he was epidemiologist for Fort Worth, Texas, coming here from that place.

The position of epidemiologist was created by legislative act in 1919. The position was filled by Dr. John J. Sippy from 1919 to 1923, when the office had to be discontinued on account of lack of appropriation. In April, 1928, the International Health Division of the Rockefeller Foundation came to the aid of the State Board of Health and is bearing half the expenses of this division at the present time.

Dr. Hazel Dell Bonness is director of the Child Welfare Division and has held this position since 1923. Doctor Bonness graduated from the University of Minnesota in 1913 with the degrees of B. S. and M. D. She spent two years as interne in the New England Hospital for Women and Children, and taught physiology and hygiene at Vassar for two years. At the outbreak of the war she connected up with the American Red Cross and went to France where she did child welfare work for about a year and was then detailed to Serbia and afterwards to Roumania, always engaged in public health work. She received from the French government the *Medaille des Epidemies* of the first class because of hospital work, and from the Serbian government the Order of St. Sava for work with children in Serbia.

L. L. Benepe has charge of the Vital Statistics Division. Mr. Benepe is a graduate of the Montana State College and has had special training in vital statistics, having received a fellowship from the Rockefeller Foundation and spent a year in Johns Hopkins School of Public Health.

The Water and Sewage Division is in charge of H. B. Foote, who graduated from Ottawa University, Kansas, receiving the degree of B. S. He also took post-graduate work at the Kansas University, and was instructor in bacteriology at the Montana State College before being employed by the State Board of Health. He received a fellowship from the Rockefeller Foundation and spent a year at Harvard University Sanitary Engineering School.

Fred Stimpert is in charge of the Hygienic Laboratory. Mr. Stimpert is a graduate of the University of Montana, majoring in bacteriology. He spent a year in a commercial laboratory, then taught bacteriology four years in the University of Montana, after which he spent a year at the Pasteur Institute in France. He has as his assistant Edith Kuhns, a graduate of Montana State College, who, after spending two years as technician in the State Board of Health laboratory, was given a fellowship by the Rockefeller Foundation and spent a year in Johns Hopkins School of Public Health.

Glenn D. Wiles, director of the Food and Drugs Division, is a graduate of the Montana State College, majoring in chemistry, paying particular attention to food and drug chemistry. He has been with the department for six years.

These are all technical men and women, highly trained in their particular lines. There has been absolutely no politics involved in their appointment. All political parties have given splendid support to the State Board of Health, but if we expect to continue these men in office some of them must have an increase in salary. It would be a distinct loss to the State to lose any of them. In times past we have lost some excellent men on account of the fact that the salaries paid them by the State were not sufficiently attractive. The attention of the appropriations committee will be called to this matter.

The relations between the State Board of Health and the local and county health officers throughout the state have been very pleasant. We believe that on the whole the health officers have done good work. Some of them are slow in reporting to this office so that they do not really get credit for the work they do. Most of them are under-paid and do far more work than they are paid for. If the people expect to have strong local health departments they must expect to pay for them.

We wish at this time to recognize the aid, financial and otherwise, that has been given to the State Board of Health by agencies outside the state. The American Social Hygiene Association contributed five hundred dollars to the State Board of Health, which was used for paying traveling expenses of lecturers and furnishing educational material for free distribution.

The United States Public Health Service has given financial aid to Cascade County, Lewis & Clark County, and Big Horn County to maintain full-time health departments. This Service has for a number of years been doing investigational work on spotted fever, working at times under conditions far from satisfactory. The last session of the legislature appropriated \$60,000.00 to construct a laboratory in the Bitter Root Valley in order to supply proper quarters for the carrying on of the investigational work of the United States Public Health Service and the State Board of Entomology. The United States Public Health Service is paying the state \$200.00 a month rent for the part of the building which they occupy.

This Service has developed a vaccine for the prevention of Rocky Mountain spotted fever. This has been furnished free to the doctors of

the state on application. The 1928 supply was not equal to the demand but it is expected that this vaccine will be produced in a much larger quantity for the 1929 season.

The State Board of Entomology is experimenting with a parasite to kill the woodtick. A full account of the work of the State Board of Entomology will be found in its biennial report, which can be secured on application.

The International Health Division of the Rockefeller Foundation has done much to develop public health work in Montana. Three members of the staff of the State Board of Health have received fellowships from the Rockefeller Foundation in order to better fit them for their work. In addition to this the Foundation has given financial aid to the hygienic laboratory and the water and sewage laboratory, and is now aiding in the support of the epidemiologist. It is also giving financial aid in the support of the Big Horn County health unit.

The American Child Health Association, on the request of the Livestock Sanitary Board and the State Board of Health, made a milk survey in various towns of the state. State law puts milk control in the hands of the Livestock Sanitary Board. As there are often many health questions involved in the production and handling of milk, there has been very close cooperation between the Livestock Sanitary Board and the State Board of Health.

There have been at least two milk-borne epidemics in Montana during the past biennium,—one of scarlet fever and one of typhoid, due to carriers handling the milk in the dairies. The only absolute prevention of such epidemics is proper pasteurization of milk. We do not believe it feasible at the present time to enact and enforce a state law for universal pasteurization, but we do urge cities to pass ordinances requiring the pasteurizing of milk sold in towns where proper inspection of pasteurizing plants can be arranged for.

The State Board of Health has been given splendid support by many non-official agencies such as the women's clubs, League of Women Voters, parent-teacher associations, the Red Cross, and particularly the State Tuberculosis Association. There has been very close cooperation between the Child Welfare Division and the Tuberculosis Association in aiding counties in securing public health nurses.

At this time we wish to recognize the aid given to the Child Welfare Division during the illness of its director, by Mrs. Sara E. Morse, Secretary of the Tuberculosis Association.

A short report from each of the divisions will follow. These reports will show that the work of each division is continually increasing, as is the work of all the state departments. If the work of the State Board of Health is to keep up with the rapid development of the state in other lines, there must be increased appropriations.

BIENNIAL REPORT OF THE DIVISION OF COMMUNICABLE DISEASES

By J. H. Crouch, M. D., C. P. H., State Epidemiologist

The division of communicable diseases was established as a part of the Montana State Health Department's organization in 1919 when the Legislature created the position of State Epidemiologist whose duties are "to study the causes and prevalence of diseases in the State of Montana, to take proper steps to check such diseases, and to assist the local and county health officers in the suppression of these diseases and perform such other duties as the State Board of Health may direct."

A study of the records for the past several years showed that while a large portion of the local health officers were reporting their communicable diseases to the state department with a fair degree of completeness and regularity, quite a few of them were rather delinquent. These were mostly located in the more remote and sparsely populated districts. The first task, then, seemed to be the securing of closer contact between these men and the state department. This was attempted by correspondence and personal visits whenever possible, with the result that during the past six months the total number of weekly reports from county and local health officers has been increased about fifty per cent. Between April 8, 1928, and October 31, 1928, the Epidemiologist visited thirty-eight county and local health officers, some of them several times. Many of these visits were at the request of the health officers to investigate outbreaks of diseases or to advise them in the handling of unusual problems.

Since the last biennial report covered the years 1924, 1925 and the first ten months of 1926 in its discussion of communicable diseases, this report will give the complete figures for the year 1926 as well as the year 1927 and the first ten months of 1928. The accompanying table gives the number of cases of the more important diseases occurring in these periods.

Disease	Number of Cases Reported		
	1926	1927	1928 10 mos.
Tuberculosis	276	222	236
Typhoid Fever	117	108	122
Smallpox	395	575	681
Diphtheria	208	182	195
Scarlet Fever	2065	2209	539
Measles	2596	1372	347
Epidemic Meningitis	42	165	111
Poliomyelitis	12	22	63
Spotted "Tick" Fever	36	37	32
Tularaemia	23	3	5
Trachoma	7	8	214

Tuberculosis. In Montana tuberculosis is showing a gradual but very noticeable decline corresponding to a similar decline in the disease noticed throughout the United States. This conclusion is based more

on the number of deaths reported than on the number of cases reported since the reporting of tuberculosis is not very complete. The usual estimate for fairly good reporting of tuberculosis is the report of two new cases for each death occurring in the same territory. The number of deaths occurring in Montana was 371 in 1926 360 in 1927 and 250 during the first ten months in 1928. The number of new cases reported during the same periods as given in the preceding table is 276 in 1926, 222 in 1927 and 236 during the first ten months of 1928. The increased number of cases reported in 1928 taken in conjunction with the steady decline in number of deaths is rather conclusive evidence that physicians are recognizing and reporting the cases with greater accuracy.

Typhoid Fever. Typhoid fever during the past few years has been far less prevalent than it was a decade or more ago, but we still have more than one hundred cases each year. One hundred twenty-two cases were reported during the first ten months in 1928, this being a slight increase over the two previous years. There was one milk-borne epidemic in Billings with eighteen cases and two deaths, and an endemic occurrence of the disease in Libby where 27 cases with one death have occurred in 1928, the cases being spread out through the entire year. Repeated investigations in Libby by various members of the state health department have shown that there is no one source of infection here but that many carriers exist in the community. Examination of all food handlers and dairy workers in September, 1928, showed that eleven of them were carriers of typhoid or para-typhoid organisms. The other seventy-seven cases were scattered throughout the state rather evenly except that there was some tendency to concentrate along the Yellowstone. Investigation showed that a vast majority of those were contracted by drinking surface water. Nearly all of the cases in the Yellowstone Valley had been drinking irrigation water and most of the others had been drinking from streams, usually in the mountains while on camping trips. The water in the Yellowstone River is of course highly polluted and its use for drinking purposes is to be condemned unreservedly. In times past the water of the mountain streams in Montana was probably fairly safe for drinking purposes but the practice of camping in the mountains has increased so much during recent years that even the most remote sections are visited by many people with the result that no mountain stream may be any longer considered safe for drinking.

Smallpox. During the past three years smallpox has increased about seventy-five per cent in the state, the cases continuing mild and there have been only five deaths, three of them being young children and two adults. About one-third of the cases have occurred in Butte where the disease is endemic. Smallpox has been reported from Butte in twenty-eight out of the thirty-four months covered by this report, and the number of cases seems to be steadily increasing.

Diphtheria. The number of cases of diphtheria has shown a very noticeable and steady decline during recent years. This decline is similar to that noticed in certain other sections of the United States where there has been a widespread use of toxin-antitoxin immunization, and

we are justified in believing that this procedure is responsible for the checking of the disease. The state department is cooperating in every way possible with the efforts of the local health officers in getting as large a number of children treated each year as possible and it can be predicted with confidence that the disease will continue to decline.

Scarlet Fever. No disease has shown a more radical change in its characteristics than has scarlet fever, the chief change being in its decreased virulence. The case fatality rate has been reduced from a previous average of twenty per cent to less than one per cent of recognized cases. Principally because of this lessened severity the number of cases has very markedly increased, since so many cases pass unrecognized and large numbers do not even consult a physician. Since no quarantine measures are adopted in these mild cases which do not consult a physician the number of exposures in each case is naturally great and many new cases result.

Measles. A study of the incidence of measles in Montana for the past twelve years shows that the outbreaks are periodic in occurrence. The outbreaks occur with definite regularity but vary somewhat from the classic three-year cycle which seems to be a characteristic of this disease. The cycle here seems to be moderately severe outbreaks in two successive years followed by one year in which there is very little. The first of the outbreak years seems to have its peak later in the winter or early spring, about April, and the second outbreak occurs with its peak the following January. Then every sixth year the January outbreak is a very severe one. This occurred in 1918 and again in 1924. There was a moderate epidemic of measles in the late winter and spring of 1926 and another occurred early in 1927. Nineteen twenty-eight has been a very mild measles year so far. If the disease continues to follow its usual cycle we may expect a moderate epidemic with its peak about April, 1929, followed by a very severe epidemic about January, 1930.

Epidemic Meningitis. Epidemic meningitis has shown a very definite increase during the past two years similar to an increase throughout the United States and is now probably our most serious communicable disease so far as number of deaths is concerned. The reason for this increase is as yet undetermined.

Poliomyelitis. This communicable disease has also shown a definite increase throughout the United States during the past two years. Montana seemed to escape the increase in 1927, but sixty-three cases occurred during the first ten months of 1928.

Spotted Fever. Since spotted fever is the subject of a special report by the Board of Entomology it will be mentioned here only to say that thirty-two cases were reported during the 1928 tick season, this being a slight reduction over previous years.

Tularaemia. This disease, which is usually contracted by the handling of infected rabbits, but may also be contracted by the bite of an infected woodtick, was first noted in Montana in 1924 and 4 cases were

reported. In 1925 we had 28 cases, and 23 cases in 1926. During 1927 and 1928, only an occasional case was seen, but our total number of cases reported is greater than that of any other state.

Trachoma. The large increase in number of cases of trachoma reported in 1928 does not mean that there is an increase in the disease in Montana but is due largely to several rather extensive surveys of public schools conducted by the State Health Department. These schools were located in Roosevelt, Glacier, Big Horn and Flathead counties. There were also a few cases reported by physicians of the Indian Medical Service. The 214 cases listed in the preceding table embrace only those active untreated cases which it was certain had not been previously reported. The surveys showed that if the post-operative cases are included, approximately twenty-five per cent of the Indian children found in the public schools surveyed have trachoma. In these same schools slightly more than one per cent of the white children are infected. Thirty-eight public schools were surveyed in the four counties mentioned and 3 538 white children examined, 49 of them showing some evidence of trachoma. All but ten had received considerable treatment and twenty were classed as cured. The United States Public Health Service and Indian Medical Service very kindly furnished the medical experts to make the examinations.

REPORT OF THE CHILD WELFARE DIVISION**Biennial Period Ending October 31st, 1928**

Hazel Dell Bonness, M. D., Director

The Child Welfare Division of the State Board of Health has for five years been largely supported by Sheppard-Towner funds, a state appropriation of \$8,700.00 and \$13,700.00 from the Children's Bureau of the United States government. This money has been, under the requirements of the Federal Maternity and Infancy Board, used entirely for maternity and infancy work. The last two state legislatures have appropriated \$2,000.00 per year for use in school and other child health work.

The Federal Sheppard-Towner Act for maternity and infancy ends June 30, 1929, and after that date, there will be no further federal funds available for maternity and infancy work unless a new federal measure is passed. This means that unless the 1929 legislature appropriates a considerably increased amount to the Child Welfare Division of the State Board of Health over former years that that division will suffer a great setback in its program of child health.

The activities of the Child Welfare Division have been increased from year to year and requests for field nurses, county nurses, literature forms and exhibit material have been received during the past two years from every county in the state. These requests have been fulfilled wherever possible within the limits of our appropriation. We have felt a certain handicap in the limiting of the funds to use for maternity and infancy work alone as we have felt that the older children have been in need also of some health work.

The activities of the Child Welfare Division have included the following:

Cooperative Projects

This includes cooperation with other divisions of the Board of Health particularly the Division of Vital Statistics.

The Division has maintained one clerk for the past two years for the Division of Vital Statistics and her duties have included the sending out of mothers' certificates which are copies of the birth certificates as received by the office. We have also aided in carrying on a constant campaign to increase the birth registration in Montana. We have, in addition, sent out a copy of Infant Care with every mother's certificate and in this way have reached every new mother in the state.

We have cooperated with the Hygienic Laboratory during the period, July 1st, 1926, to June 30, 1927, by paying nine months of the salary of the laboratory technician. This payment was made in return for special examinations done for mothers and children.

Constant cooperation has been maintained with the other divisions of the Board of Health in matters pertaining to the health and welfare of the child.

Cooperation With Other Health Agencies

We have also cooperated with the Extension Service of the State College, school boards, county commissioners, health officers and many other governmental agencies when concerned with child health activities.

Certain non-governmental organizations such as the Montana Tuberculosis Association, the American Red Cross, the State Federation of Women's Clubs, the Montana League of Women Voters, the State Parent-Teacher Association, and the State Business and Professional Women's Clubs have also worked in cooperation with us. In cooperation with the Montana Tuberculosis Association we have maintained a varying number of field nurses and county nurses. The Red Cross, the county health units and county commissioners have also aided in our county nursing services. During the past two years we have aided in promoting nursing services in the following counties: Beaverhead, Big Horn, Broadwater, Cascade, Daniels, Dawson, Flathead, Gallatin, Hill, Jefferson, Lewis and Clark, Meagher, Missoula, McCone, Prairie, Richland, Silver Bow and Wheatland counties.

Maternity and Infancy Work

The maternity and infancy program has consisted of a general educational program carried on through headquarters by means of correspondence and the distribution of literature pertaining to maternity and infancy which in the past two years has amounted to nearly 350,000 pieces. Most of this material has been distributed under the privilege of the frank and this privilege will be withdrawn June 30, 1929, which will mean a greatly increased postage bill for the division. We also maintain a good-sized film and lantern slide library which has been used in all parts of the state. This material is loaned free of charge to responsible persons requesting it. The second part of our maternity and infancy program has consisted of prenatal, infant and pre-school health conferences conducted by our staff field nurses in cooperation with local health officers and physicians.

The third part has consisted of the same type of work only, wherever possible, on a more permanent basis by county nurses who are receiving a part of their salary from Sheppard-Towner funds. Our maternity and infancy work has been carried on in every county of the state during the past two years and nearly 17,000 babies and pre-school children have been reached by this means.

School Work

The school work carried on by the Child Welfare Division has been very limited because the funds available for this type of work have been very small. Most of our \$2,000.00 appropriation has had to be spent in printing cards, forms and bulletins needed in carrying on school

health work. Our staff nurses, maintained in cooperation with the Montana Tuberculosis Association, have given a certain proportion of their time to itinerant school work.

There has been an increased number of school nurses employed by school boards throughout the state, and every new service undertaken has been continued by the school board as a very worth while part of the school program. The demands on our department for materials to be used in school health programs have been increasing each year and also the requests for cooperation in the maintaining of school nurses have shown a decided increase.

Public Health Nursing

Under the law the Child Welfare Division is given supervision over all public health nurses of the state and it provides all public health nurses with report forms. Excellent cooperation from the nurses in making their monthly reports has been received by the division. We have a very fine corps of nurses in Montana and we can feel justly proud of the work that they are doing.

At the present time there are two full time field nurses maintained jointly by the Montana Tuberculosis Association and this division.

There are fourteen county nurses who are maintained on a cooperative basis either by the Montana Tuberculosis Association or the Child Welfare Division or both aiding in a project.

There are six school nurses, two full time tuberculosis nurses, two Indian welfare nurses, one employed by the Montana Tuberculosis Association and one by the Indian Bureau of the federal government.

The division also maintains a placement bureau for public health nurses and endeavors to aid school boards and counties in the selection of a suitable nurse.

The Public Health Nurses' Bulletin is issued every two months and a small library for the use of the public health nurses of the state is also maintained.

Other Activities

The division aids and cooperates in practically all public health activities initiated by the Board of Health including cancer campaigns, social hygiene work, vital statistics publicity and in immunization campaigns.

A health column is carried in the Montana Woman, the official organ of the State Federation of Women's Clubs, and a health column on children is also carried in the Montana Farmer.

May Day, which was first started in 1923 by the American Child Health Association, has been increasingly successful in the state. During the past two years the Director of the Division has served as State Chairman and Montana has received considerable recognition for the activities carried on by the local chairmen throughout the state. It is hoped that

a permanent May Day Council may be formed during the next year so that there will be in every county a permanent committee interested in the health and welfare of children.

The Director of the Division has also served as chairman of the Pre-School Round-Up for the Parent-Teacher Association. This project is growing from year to year and the schools are beginning to feel the benefits of this very important work.

Summary

The work of the division has increased so much from 1923 to 1928 that the loss of the federal money will be felt greatly unless the present legislature meets it by an adequate appropriation.

The program of work is well established except for the school child and the need of increased work in this field is distinctly felt.

THE BIENNIAL REPORT OF THE BUREAU OF VITAL STATISTICS FOR THE YEARS 1926-1927

L. L. Benepe, Deputy State Registrar

The Bureau of Vital Statistics was created by the legislature of 1907 and became effective June first of that year. It was created for the complete and proper registration of births and deaths for legal, sanitary, and statistical purposes. The Bureau was placed under the immediate superintendence of the Secretary of the State Board of Health, who is State Registrar.

At the present time the Bureau of Vital Statistics records approximately 10,000 births and 5,000 deaths annually. In countless ways, the keeping of accurate records of the two most important events in the lives of our people is proving of great importance, for social, financial, and health benefits of the citizens. Estates may be lost and insurance withheld because proof of death cannot be shown; passports, labor and school permits, and marriages withheld all because proof of age cannot be shown. It is the function of the Bureau of Vital Statistics to promote the accurate and complete registration of these events to keep them properly filed and indexed, to furnish certified copies of any records, to supply the Census Bureau at Washington, D. C., with transcripts of the records, and to study the records so that they may be of the greatest possible value in improving health conditions.

Before the records of Montana were accepted by the Census Bureau, it was necessary to prove by certain tests made by the federal authorities, that at least ninety per cent of all births and deaths occurring in the State were properly recorded. Montana has had her records accepted and has been in the federal registration area for deaths since 1910 and for births since 1922.

Table I is inserted below to show the number of births and deaths reported, the excess of births over deaths, and the vital index. (i.e. 100 Births/Deaths for the years 1908 through 1927.) It will be noted from this table that death reporting became accurate far more rapidly than did birth reporting. There was a constant increase in birth reporting up to 1921, while the death reports remained almost constant from 1914 through to the present, except for the influenza years. The vital index column indicates that over twice as many births as deaths were registered from 1919 through 1925 with a drop in 1926 and 1927. 1927 is the first year since 1915 that fewer than 10,000 births have been registered.

TABLE 1.

The Number of Births and Deaths Occurring in Montana 1908-1927.
The Excess of Births over Deaths, and the Vital Index.

Year	Births	Deaths	Excess Births Over Deaths	Vital Index
December, 1907, through November, 1908	5,842	4,353	511	134.2
July 1, 1908, to June 30, 1909	6,021	4,241	1,780	142.0
July 1, 1909, to June 30, 1910	6,294	3,911	2,383	160.9
Calendar Year				
1910	6,124	3,996	2,128	153.2
1911	7,542	4,006	3,536	188.2
1912	8,133	4,397	3,736	185.0
1913	8,682	5,098	3,584	170.3
1914	9,969	5,048	4,921	197.5
1915	11,132	5,242	5,890	212.3
1916	11,300*	5,483	5,817	206.0
1917	11,600*	6,421	5,179	180.6
1918	11,800*	8,985	2,815	131.3**
1919	12,017	5,786	6,231	207.7
1920	11,862	5,289	6,573	224.2
1921	12,127	4,693	7,488	258.4
1922	11,060	5,106	5,954	216.6
1923	10,524	4,914	5,615	214.4
1924	10,283	4,991	5,292	206.0
1925	10,302	5,103	5,199	201.9
1926	10,008	5,375	4,633	186.1
1927	9,933	5,322	4,511	184.7

*Estimated. **Flu Year.

On January 1, 1928, a new estimate of population of the state by counties was made from the school census. The estimate gives a population of 546,000 and shows that we are again approximating the 1920 census. This estimate was made in collaboration with the State Department of Agriculture.

The following table gives the counties, the population in 1920 and the population on January 1, 1928, as estimated from the school census.

TABLE II

The Population of Montana by Counties, 1920 and 1928.

COUNTIES	Estimated Population, Jan. 1, 1928	Population 1920
Montana (state total)	546,078	548,889
Beaverhead	5,061	7,369
Big Horn	9,569	7,015
Blaine	6,960	9,057
Broadwater	2,637	3,239
Carbon	14,032	15,279
Carter	3,432	3,972
Cascade	39,384	37,145
Chouteau	7,348	11,051
Custer	11,224	12,194
Daniels	6,536	5,480
Dawson	8,895	9,239
Deer Lodge	19,642	15,323
Fallon	4,507	4,548
Fergus	17,975	23,216
Flathead	18,533	21,705
Gallatin	17,849	15,864
Garfield	4,368	5,368
Glacier	5,843	4,178
Golden Valley	2,665	4,276

TABLE II (Continued)

	Estimated Population Jan. 1, 1928	Population 1920
Granite	3,278	4,167
Hill	12,677	13,958
Jefferson	4,569	5,203
Judith Basin	4,342	6,819
Lake	9,810	*
Lewis & Clark	18,384	18,660
Liberty	1,571	2,416
Lincoln	8,263	7,797
McCone	4,686	4,747
Madison	6,058	7,495
Meagher	2,209	2,622
Mineral	2,013	2,327
Missoula	18,919	24,041
Musselshell	7,286	8,228
Park	11,002	11,330
Petroleum	2,176	*
Phillips	7,476	9,311
Pondera	6,108	5,741
Powder River	3,058	3,357
Powell	5,734	6,909
Prairie	4,045	3,684
Ravalli	9,061	10,098
Richland	9,674	8,989
Roosevelt	11,513	10,347
Rosebud	7,276	8,002
Sanders	4,731	4,903
Sheridan	10,418	9,376
Silver Bow	64,808	60,313
Stillwater	6,761	7,630
Sweet Grass	4,176	4,452
Teton	5,978	5,870
Toole	4,908	3,724
Treasure	1,066	1,990
Valley	13,802	10,533
Wheatland	4,184	5,619
Wibaux	2,339	3,113
Yellowstone	35,259	29,600

* Lake and Petroleum Counties created since 1920.

Births 1926

In 1926 there were 10,008 births recorded in the state giving a birth rate of 18.3 per 1,000 of population. The highest 1926 birth rates are shown for Treasure County (38.4), Musselshell County (27.4), and Roosevelt County (27.2). The lowest 1926 birth rates are shown for Jefferson County (8.1), Granite (8.2), and Golden Valley (10.1).

Births 1927

The 1927 birth rate was 18.0 per 1,000 of population or 0.3 per 1,000 lower than 1926. There was 9,833 births reported, a decrease of 175 under 1926. The highest 1927 rates are shown for Treasure County (37.5), Pondera (30.6) and Hill (27.1). The lowest 1927 rates were for the counties of Meagher (7.7), Jefferson (7.9) and Granite (8.2).

Deaths 1926

In 1926 there were 5,375 deaths reported, giving a death rate of 9.8 per 1,000 of population. The counties showing the highest death rates in 1926 were, Deer Lodge* (17.1), Silver Bow (13.9) and Blaine (13.8). Those showing the lowest rates were, Golden Valley County (2.2), Judith Basin (4.1) and Powder River (4.2).

Deaths 1927

During 1927 there were 5,322 deaths reported, giving a death rate of 9.7 per 1,000 of population or 0.1 per 1,000 in rate under 1926 and 53 less deaths. The counties showing highest death rates were, Deer Lodge* (18.3), Glacier (15.9), Missoula and Beaverhead tying for third highest with (14.4) each. The counties having the lowest death rates were, McCone (3.0), Petroleum (3.7) and Garfield (3.7) making a tie for second low, and Judith Basin (3.9).

*Deer Lodge County includes the State Hospital and Tuberculosis Sanitarium.

Compared to the other states of the Registration Area, the Census Bureau gives Montana credit with the lowest birth rates of any state for both 1926 and 1927, while we are shown to have the second lowest death rate for both years, Idaho being the only state with lower death rates than ours.

Tables III and IV following, show the births by months and counties with the rates per 1,000 of population for 1926 and 1927, respectively.

Tables V and VI following show the deaths by months and counties with the rates per 1,000 for 1926 and 1927, respectively.

TABLE III.

1926 Births by Months and Counties, and the Rate per 1,000 of Population.

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total	Rate Per 1,000
Montana (St. total)	875	843	876	875	911	799	811	902	782	844	759	731	10,008	18.3
County—														
Beaverhead	9	5	8	1	15	10	3	7	8	8	8	9	91	18.0
Big Horn	19	18	29	18	22	18	11	13	13	21	20	14	216	22.7
Blaine	22	14	18	16	12	14	10	16	14	14	16	14	180	25.9
Broadwater	2	3	4	3	2	4	3	5	2	4	3	4	39	14.8
Carbon	24	23	18	22	35	11	17	21	18	24	17	14	244	17.4
Carter	1	6	7	6	8	4	6	6	7	9	8	5	73	21.3
Cascade	76	57	67	71	71	56	62	79	71	68	65	66	809	20.5
Chouteau	5	12	1	14	7	8	8	7	9	7	9	9	96	13.1
Custer	23	13	23	17	20	17	25	18	18	18	20	19	231	20.6
Daniels	10	16	12	17	13	13	13	17	17	10	12	15	165	25.2
Dawson	24	18	19	17	17	12	23	11	22	18	17	21	210	23.6
Deer Lodge	21	19	27	24	26	19	17	25	25	24	13	17	257	13.1
Fallon	11	9	5	8	11	8	8	10	12	7	7	13	109	24.2
Fergus	37	38	36	35	31	27	21	20	26	37	32	32	372	20.7
Flathead	26	34	38	35	34	34	29	33	30	28	30	22	373	20.1
Gallatin	27	27	19	22	28	24	20	27	28	27	29	16	294	16.5
Garfield	3	2	3	8	6	6	6	7	3	4	2	4	54	12.4
Glacier	14	11	19	11	11	7	12	14	7	13	8	9	136	23.3
Golden Valley	3	5	2	2	3	1	1	2	3	2	2	1	27	10.1
Granite	1	1	4	2	3	3	3	2	2	3	1	2	27	8.2
Hill	27	18	28	25	29	28	22	18	24	23	27	12	281	22.2
Jefferson	3	1	9	2	4	1	4	4	3	3	3	3	37	8.1
Judith Basin	3	9	5	7	5	5	4	7	4	1	3	3	56	12.9
Lake	12	16	14	19	15	12	13	18	12	12	14	8	165	16.8
Lewis & Clark	21	28	22	24	34	36	30	28	23	24	18	27	315	19.1
Liberty	3	5	2	3	1	2	2	2	1	4	4	2	31	19.7
Lincoln	10	12	11	10	16	11	9	10	8	9	10	13	129	15.6
McCone	4	11	9	7	5	5	11	4	4	9	6	5	80	17.1
Madison	3	7	10	9	6	8	3	9	6	5	3	3	72	11.9
Meagher	1	2	1	3	2	2	4	3	3	1	1	3	26	11.8
Mineral	5	1	5	2	1	1	3	1	1	1	1	1	23	11.4
Missoula	42	35	32	33	36	31	28	25	25	32	29	21	369	19.5
Musselshell	17	14	17	18	16	22	24	16	12	20	14	10	200	27.4
Park	16	16	17	17	21	12	21	16	20	21	15	10	202	18.4
Petroleum	2	3	3	1	2	4	4	1	1	2	1	1	25	11.4
Phillips	9	12	14	14	7	9	15	15	14	16	9	8	142	19.0
Pondera	14	11	12	16	21	13	17	13	8	9	9	12	155	25.4
Powder River	7	5	6	7	1	5	7	5	3	6	1	6	59	19.3
Powell	6	4	8	3	11	8	5	13	6	5	7	8	84	14.6
Prairie	3	7	5	6	8	8	8	10	6	9	8	9	87	21.5
Ravalli	16	8	8	12	10	20	13	14	18	18	6	10	153	16.9
Richland	24	21	12	21	19	11	22	13	11	16	16	18	204	21.1
Roosevelt	26	42	31	25	25	19	25	27	21	29	20	23	313	27.2
Rosebud	14	13	14	17	14	12	18	18	11	11	12	9	163	22.4
Sanders	6	8	5	4	6	4	6	9	8	10	7	5	78	16.5
Sheridan	25	22	18	15	15	23	17	27	21	19	8	20	230	22.1
Silver Bow	99	67	88	71	80	75	79	100	67	82	69	85	953	14.7
Stillwater	10	11	10	11	16	12	13	18	11	10	5	7	134	19.8
Sweet Grass	3	5	9	4	12	10	3	9	7	6	3	7	78	18.7
Teton	6	3	3	8	7	6	4	4	5	4	3	5	58	9.7
Toole	6	4	6	12	2	8	9	10	7	5	5	9	83	16.9
Treasure	7	5	2	6	6	4	2	3	1	3	1	1	41	38.4
Valley	19	15	26	24	14	21	21	16	29	23	26	16	250	18.1
Wheatland	8	10	3	7	6	6	5	3	6	6	7	3	70	16.7
Wibaux	5	3	6	5	6	5	1	5	1	1	4	3	45	19.2
Yellowstone	44	58	46	58	57	44	52	56	50	39	64	46	614	17.4

TABLE IV.

1927 Births by Months and Counties, and the Rate per 1,000 of Population.

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total	Rate Per 1,000
Montana (St. total).....	836	802	841	840	842	822	846	893	811	773	767	760	9833	18.0
County—														
Beaverhead	11	7	5	4	7	4	10	8	5	5	10	10	86	17.0
Big Horn	23	13	19	17	11	18	15	15	12	8	21	19	191	20.0
Blaine	19	19	14	13	16	14	19	20	14	13	13	12	186	26.7
Broadwater	2	2	1	1	6	4	1	1	2	3	4	26	9.9	
Carbon	18	28	24	28	18	29	25	16	25	15	22	21	269	19.2
Carter	2	4	8	5	7	4	7	3	6	11	3	7	67	19.5
Cascade	63	82	70	79	60	64	69	78	77	67	52	55	816	20.7
Chouteau	9	7	4	8	13	7	9	10	8	12	9	5	101	13.7
Custer	19	15	20	11	14	17	21	26	17	20	20	19	219	19.5
Daniels	13	11	9	14	18	13	15	18	15	12	15	11	168	25.7
Dawson	10	15	12	17	20	20	18	20	9	16	11	11	179	20.1
Deer Lodge	20	13	24	16	22	19	20	20	20	18	20	18	230	11.7
Fallon	8	7	5	6	5	11	10	14	10	7	10	5	98	21.7
Fergus	30	31	31	32	35	30	35	46	38	23	29	28	388	21.6
Flathead	37	27	17	33	41	34	37	26	34	26	28	21	361	19.5
Gallatin	26	42	27	28	31	29	31	31	21	23	21	26	336	18.8
Garfield	2	1	3	2	3	6	4	4	4	7	2	6	44	10.1
Glacier	17	11	13	8	7	13	14	8	15	11	8	11	136	23.3
Golden Valley	7	5	1	3	3	3	6	3	1	1	3	1	37	13.9
Granite	7	1	4	6	5	5	1	1	2	1	1	1	27	8.2
Hill	31	28	36	29	29	23	25	28	29	31	28	26	343	27.1
Jefferson	3	3	6	1	5	1	2	5	1	5	2	2	36	7.9
Judith Basin	3	5	5	6	1	3	7	3	2	2	2	2	39	9.0
Lake	9	22	16	14	12	20	12	19	11	12	18	19	184	18.8
Lewis & Clark	17	19	28	28	31	19	25	25	21	21	21	21	276	15.0
Liberty	2	3	3	2	2	2	3	1	1	1	2	1	22	14.0
Lincoln	9	7	15	14	10	12	12	15	12	4	5	11	126	15.2
McCone	8	3	7	8	4	4	6	4	5	8	6	1	64	13.7
Madison	7	3	11	8	9	6	10	5	5	5	4	6	79	13.0
Mcagher	1	1	1	2	2	2	3	1	1	3	1	1	17	7.7
Mineral	4	1	3	3	5	3	2	1	4	2	1	1	26	12.9
Missoula	45	31	23	41	32	40	32	32	26	23	22	34	381	20.1
Musselshell	12	14	16	12	12	6	12	11	15	18	11	12	151	20.7
Park	17	18	14	16	19	15	17	15	19	11	11	15	187	17.7
Petroleum	9	1	1	2	1	5	2	3	3	3	4	3	30	13.8
Phillips	11	20	11	10	16	7	15	21	14	19	11	9	164	21.9
Pondera	15	12	16	15	21	11	7	14	21	14	22	19	187	30.6
Powder River	6	3	4	3	2	8	1	5	5	4	5	4	46	15.0
Powell	6	7	8	5	8	5	6	9	6	2	6	10	78	13.6
Prairie	7	2	6	4	6	6	2	6	2	5	4	13	63	15.6
Ravalli	14	10	17	9	14	15	16	18	21	10	18	8	170	18.8
Richland	16	12	21	14	8	15	22	21	20	23	16	20	208	21.5
Roosevelt	19	20	24	17	28	22	19	24	25	26	22	29	275	23.9
Rosebud	19	7	11	8	11	13	15	11	11	12	14	18	150	20.6
Sanders	5	6	6	3	5	7	1	1	1	3	4	6	47	9.9
Sheridan	16	16	19	15	18	22	15	8	15	16	16	13	189	18.1
Silver Bow	81	72	70	84	80	79	93	66	79	69	66	90	900	13.9
Stillwater	11	7	11	12	9	9	12	14	14	11	11	5	126	18.6
Sweet Grass	3	7	9	6	6	11	10	9	9	6	9	6	91	21.8
Teton	3	5	5	6	8	6	4	8	3	5	4	6	63	10.5
Toole	4	8	7	7	10	14	8	8	7	6	7	10	96	19.6
Treasure	4	5	3	6	2	2	3	3	4	3	3	2	40	37.5
Valley	25	22	24	25	17	19	25	23	22	21	23	18	264	19.1
Wheatland	7	7	9	8	5	1	4	8	6	6	6	8	75	17.9
Wibaux	2	4	6	3	4	6	4	5	4	5	5	5	53	22.7
Yellowstone	49	52	63	64	53	54	52	49	49	48	51	38	622	17.6

TABLE V.

1926 Deaths by Month and Counties, and the Rate per 1,000 of Population.

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total	Rate Per 1,000
Montana (St. total).....	446	471	585	475	439	434	398	397	413	433	414	470	5375	9.8
County—														
Beaverhead	5	4	7		3	10	4	7	7	12	3	4	66	13.1
Big Horn	9	7	6	10	4	2	5	5	1	14	6	14	83	8.7
Blaine	11	6	7	7	12	8	7	5	11	9	6	7	96	13.8
Broadwater	2	2	3		1	2	1	2	3	2	3	3	21	8.0
Carbon	10	8	10	8	2	4	11	6	2	11	6	5	83	5.9
Carter	3	1	4		3				2	3	1	1	18	5.2
Cascade	29	32	32	28	29	33	29	31	30	32	31	33	369	9.4
Chouteau	1	3	5	2	5	7	1	5	7	3	2	3	44	6.0
Custer	17	9	4	8	13	14	11	16	10	4	6	6	118	10.5
Daniels	4	3	11	3	4	3	3	1	5	5	4	4	50	7.6
Dawson	7	4	15	13	10	3	6	9	5	9	6	11	98	11.0
Deer Lodge	26	24	28	35	37	29	21	20	27	24	26	38	335	17.1
Fallon	4		2	1	3	2	2	3	4	2		4	27	6.0
Fergus	10	25	20	23	13	12	13	12	7	10	18	12	182	10.1
Flathead	12	11	24	18	19	13	19	22	18	15	18	14	203	11.0
Gallatin	7	10	19	9	12	11	13	12	11	13	17	9	143	8.0
Garfield	1		4		1	2	6	1	3		2	2	22	5.0
Glacier	6	11	10	6	6	4	2	2	1	2	3	5	58	9.9
Golden Valley		1		2	1		1			1			6	2.2
Granite	3		5	5	3	5	4	2	1	1	3	5	37	11.3
Hill	9	18	10	9	11	16	8	12	10	11	9	11	134	10.6
Jefferson	4		4	3	3	2	7	1	5	5	2	4	40	8.8
Judith Basin	3	1	5	3		3	3	1	2				18	4.1
Lake	3	9	4	5	10	7	8	8	9	3	5	12	83	8.5
Lewis & Clark	21	20	24	22	17	14	11	15	18	20	21	21	224	12.2
Liberty			1	4	1	1	1	2	1	2	1	1	15	9.5
Lincoln	5	6	3	4	3	4	2	4	3	4	5	5	48	5.8
McCone	3	1	2	1	2	3	5	1	3			2	20	4.3
Madison	3	5	3	5	4	10	1	3	6	2	7	7	56	9.2
Meagher		2		5	1	1	2	2	2	2		2	19	8.6
Mineral	5		1	3	2		4	3	1			2	21	10.4
Missoula	25	21	37	19	20	28	22	20	30	25	29	21	297	15.7
Musselshell	3	5	9	10	2	1	5	2	7	5	3	3	55	7.5
Park	13	11	8	12	11	4	9	5	9	9	7	12	110	10.0
Petroleum	4		3	1		1		1		1			11	5.1
Phillips	2	8	6	5	3	2	3	4	3	3	5	2	46	6.2
Pondera	3	6	6	8	4	2	5	4	9	6	1	5	59	9.7
Powder River		2	1	1	2		4		1	2			13	4.2
Powell	7	3	9	3	6	6	4	5	4	7	6	4	64	11.2
Prairie	2	1	2	3	2	1	3			2			18	4.5
Ravalli	12	8	8	6	8	6	8	11	6	5	3	10	91	10.0
Richland	3	7	11	8	5	4	1	3	2	5	3	8	60	6.2
Roosevelt	10	8	16	12	10	10	8	9	3	7	9	8	110	9.6
Rosebud	10	6	12	7	8	7	5	7	7	5	8	6	88	12.1
Sanders		3	4	3	3	8	6	6	6	2	4	3	48	10.1
Sheridan	8	7	14	6	2	8	6	3	1	8	4	3	70	6.7
Silver Bow	75	91	95	74	61	72	55	54	76	77	75	97	902	13.9
Stillwater	6	9		8	7	7	5	3	2	1	1	3	52	7.7
Sweet Grass	2		7	2	3	5	4	5	2	2	4	1	37	7.9
Teton	2	4	5	7	1	5		2	5	3	1	5	42	7.0
Toole	5	2	4	5	7	4		3	5	8	7	2	52	10.5
Treasure	1	2	1	1		1		1		3		1	11	10.3
Valley	4	8	10	4	6	6	4	12	2	8	7	5	76	5.5
Wheatland	1	5	2	3	1	1		2					21	5.0
Wibaux	3	3	2	3	1	2	3				2		18	7.7
Yellowstone	22	27	41	22	31	14	25	20	22	17	22	24	287	8.1

TABLE VI.

1927 Deaths by Month and Counties, and the Rate per 1,000 of Population.

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total	Rate Per 1,000
Montana (St. total).....	538	436	488	478	451	471	427	392	364	417	390	470	5322	9.7
County—														
Beaverhead	7	4	2	10	8	6	6	12	3	3	5	7	73	14.4
Big Horn	7	14	10	7	8	7	8	7	3	9	8	5	93	9.7
Blaine	10	6	4	9	9	4	6	6	5	5	9	8	81	11.6
Broadwater	3	1	2	2	4	4	1	1	4	2	1	3	24	9.1
Carbon	13	15	14	18	9	11	6	13	8	6	4	8	125	8.9
Carter	2	2	5	1	1	5	2	1	3	3	1	3	24	7.0
Cascade	32	28	35	44	32	35	31	22	24	32	30	39	384	9.7
Chouteau	6	3	4	5	3	3	4	3	2	4	4	5	46	6.3
Custer	7	3	17	8	10	11	7	11	12	7	6	11	110	9.8
Daniels	1	1	3	3	5	3	1	3	3	3	3	6	35	5.4
Dawson	11	4	12	6	7	6	3	6	13	7	9	5	89	10.0
Deer Lodge	29	21	40	26	35	32	34	34	26	29	26	29	361	18.3
Fallon	1	2	4	2	2	1	3	4	3	2	6	30	6.7	
Fergus	16	12	9	17	15	17	12	6	12	17	11	16	154	8.6
Flathead	26	17	11	15	16	17	16	18	13	17	19	16	201	10.8
Gallatin	17	19	16	13	9	11	10	22	7	14	12	15	165	9.2
Garfield	4	4	1	5	2	1	2	1	1	1	1	1	16	3.7
Glacier	11	8	15	7	7	9	9	3	7	3	10	3	93	15.9
Golden Valley	4	4	4	2	1	4	1	1	1	1	1	1	13	4.9
Granite	4	3	1	2	3	3	3	4	3	1	1	5	30	9.2
Hill	10	11	10	12	10	12	10	7	13	11	9	12	127	10.0
Jefferson	3	1	2	2	5	3	2	2	4	4	1	1	30	6.6
Judith Basin	3	3	1	1	1	1	2	1	1	2	1	3	17	3.9
Lake	13	5	12	5	7	14	8	14	11	10	3	9	111	11.3
Lewis & Clark	25	16	15	23	13	22	24	16	16	19	17	17	223	12.1
Liberty	3	1	2	1	1	3	1	2	1	3	1	1	18	11.5
Lincoln	4	5	5	3	4	2	4	1	2	1	6	6	43	5.2
McCone	1	1	1	1	1	1	1	3	3	3	2	14	3.0	
Madison	8	6	6	7	5	5	7	6	2	4	5	3	64	10.6
Meagher	1	3	2	2	1	2	1	2	1	1	3	2	18	8.1
Mineral	1	1	3				2					3	10	5.0
Missoula	28	27	26	22	16	27	21	19	20	24	15	28	273	14.4
Musselshell	7	6	7	4	4	6	7	4	6	7	2	4	64	8.8
Park	11	16	9	11	9	10	9	7	6	5	8	9	110	10.0
Petroleum	1	1	1	2	1	1	1	1			2		8	3.7
Phillips	2	6	3	4	5	2	4	5	5	6	5	47	6.3	
Pondera	6	1	4	7	10	4	2	1	3	6	9	2	49	8.0
Powder River	3	2	1	4	4	2	1	1			1	1	16	5.2
Powell	4	7	11	4	5	5	5	1	5	4	7	2	60	10.5
Prairie	2	2	3	2	2	4	3	2		2	2	2	26	6.4
Ravalli	8	6	7	13	15	6	5	6	5	6	10	5	92	10.2
Richland	3	5	7	9	8	1	2	5	1	5	3	7	56	5.8
Roosevelt	9	3	11	5	9	7	6	6	7	5	5	10	83	7.2
Rosebud	25	19	12	8	5	6	6	4	7	3	5	5	105	14.4
Sanders	4	6	6	5	4	1	7	3	3	3	5	1	42	8.9
Sheridan	4	6	4	6	4	3	2	1	3	6	1	7	47	4.5
Silver Bow	84	76	63	76	65	79	77	55	43	74	67	80	839	12.9
Stillwater	6	3	1	3	5	5	3	3	2	2	4	6	43	6.4
Sweet Grass	5	5	3	5	3	4	2	1	3	2	4	3	40	9.6
Teton	1	3	3	3	5	1	1	8	3		1	3	32	5.4
Toole	2	2	5	5	4	6	6	2	4	7	3	4	50	10.2
Treasure	1	1	1	2	1	2	1	1	1	2	1	1	10	9.4
Valley	10	5	4	6	7	6	4	6	3	8	5	5	69	5.0
Wheatland	3	1	1	3	2	1	2	1		3		6	22	5.3
Wibaux	2	1	3	2	1	2	1	2	1	1		1	17	7.3
Yellowstone	28	23	24	22	23	30	30	23	29	26	20	22	300	8.5

The research work i.e., inquiries relative to birth and death records has been constantly increasing during the past few years. In 1925 the files were searched and information sent out relative to 1,958 birth and death records; in 1926 this increased to 3,450, and in 1927 to 3,667.

The comparison of deaths and rates per 100,000 of population in 1926 and 1927 from certain diseases and conditions is as follows:

Communicable Diseases				
Disease	1926		1927	
	Deaths	Rate	Deaths	Rate
Typhoid	14	2.5	15	2.7
Small Pox	1	0.2	1	0.2
Measles	19	3.5	26	4.7
Scarlet Fever	25	4.6	26	4.7
Whooping Cough	43	7.8	14	2.5
Diphtheria	15	2.7	23	4.2
Influenza	211	38.4	149	27.1
Mumps	1	0.2	2	0.4
Erysipelas	23	4.2	25	4.6
Poliomyelitis	4	0.7	4	0.7
Lethargic Encephalitis	7	1.3	7	1.3
Epidemic Meningitis	16	2.9	70	12.7
Spotted Fever	16	2.9	5	0.9
Tuberculosis	371	67.6	361	65.7
Syphilis	28	5.1	36	6.6
Other Important Causes of Death				
Cancer	402	73.2	418	76.2
Diabetes	73	13.3	73	13.3
Alcoholism	43	7.8	80	14.6
Apoplexy	406	74.0	351	63.9
Heart	518	94.4	693	126.3
Pneumonia (all forms)	558	101.7	395	72.0
Diarrhea and Enteritis	103	18.8	72	13.1
Nephritis	327	59.6	324	59.0
Puerperal*	82	8.2	68	6.9
Suicides	94	17.1	111	20.2
Total Accidents	468	85.3	485	88.4
Auto Accidents	94	17.1	75	13.7
Homicides	35	6.4	38	6.9
Infants under 1 year*	738	73.7	651	66.1

*Rate per 1,000 live births.

Analyzing the first half of the table, that of the communicable or preventable diseases, we find only two significant increases in 1927 over 1926, these being epidemic meningitis and syphilis. Diphtheria also shows an increase. Significant decreases are shown for whooping cough, influenza, and spotted fever. Tuberculosis (all forms) shows a slight decrease.

For the other causes of death, we find an increase in 1927 for cancer, alcoholism, heart conditions and suicides. Decreases are shown for apoplexy, pneumonia (all forms), auto accidents, and an altogether gratifying decrease for puerperal conditions and for deaths of infants under one year of age.

There were 361 deaths from all forms of tuberculosis reported in 1927 which is 10 less than was reported in 1926, and 28 more than in 1921, which year was the state's lowest previous record.

In 1926, Montana had its lowest death rate from diphtheria, only 15 deaths occurring that year. In 1927 there were 23 deaths, an increase of 8 and that year had the second lowest death rate in history from this disease.

There were 651 babies died before reaching their first birthday in 1927, a decrease of 87 under 1926. The infant mortality rate was 66.2 per 1 000 live births, making 1927 the second lowest infant death rate in history.

During the past four years the deaths from automobile accidents have increased at an alarming rate. In 1923 there were 47 deaths; in 1924, 70 deaths; in 1925, 82 deaths, and in 1926, 94 deaths. If this increase had continued we could have expected 108 deaths from such accidents in 1927, whereas there were only 70, the same number we had in 1924. Considering the increased number of automobiles in Montana last year over the previous years, this low number of deaths may be considered remarkable. The National Automobile Chamber of Commerce states in their report of March 28, 1928, that Montana showed the greatest percentage decrease in automobile accidents of any state in the Union. This decrease amounted to 16 per cent. Only nine other states showed decreases in auto accidents and the whole country showed an increase of 8 per cent.

Indians

Astounding figures come from the study of the Indian statistics of the state. Montana's Indian population is estimated by the Bureau of Indian Affairs to be 13,273, which is 2.4 per cent of our total population. These 2.4 per cent in 1927 furnished 340, or 6.4 per cent of the total deaths and 491, or 5 per cent of the births of the state.

The total Indian death rate per 1,000 of population was 26.1 and 25.8 for 1926 and 1927. The birth rate was 34.1 and 37.0, respectively, for those years. Compared to the White rates, the Indian death rate is 2.7 times higher, and the birth rate is over twice as high. The Indian birth-death ratio is four births to three deaths and the White is two births to one death. The Indian infant mortality rate was 185.4 and 175.2 per 1,000 live births, compared to 68.4 and 60.5 for the White rate for 1926 and 1927.

In the year 1926 there were 371 deaths from all forms of tuberculosis, of which 97 were Indians, and in 1927 there were 361 deaths, of which 110 were Indians. The death rates respectively for Whites and Indians for 1926 were 51.1 and 730.8; for 1927 they were 46.1 and 828.7 per 100,000 of population. Of the 340 total Indian deaths in 1927, 32.1 per cent were from tuberculosis. We may say, then, that every third Indian dying in Montana last year died from some form of tuberculosis.

REPORT OF THE DIVISION OF WATER AND SEWAGE.**Biennial Period Ending October 31, 1928.**

H. B. Foote, Director.**W. M. Cobleigh, Consultant.****J. W. Forbes, Assistant.**

The principal work of the Division of Water and Sewage is comprised of the following activities:

1. Bacteriological and chemical examination of water samples of both public and private supplies.
2. Field inspection of public and private water supplies.
3. Inspection of plans for public water supplies.
4. Field inspection of sewage disposal systems.
5. Inspection of plans for public sewage disposal systems.
6. Inspection of tourist camps and their water supplies.
7. Inspection and approval of plans for public school buildings.

A limited amount of interchange of work is made with the Food and Drug Division in the field whereby economy is effected.

Laboratory Analysis of Water.

The analysis of samples of water makes up the bulk of the laboratory work. A check upon the condition and operation of public water supplies is obtained by frequent routine bacteriological analysis. In order that each supply will receive proper attention at regular intervals, a calendar has been prepared which lists for each week the cities to which sampling equipment is to be sent. The equipment is usually sent out on Thursday.

The State Board of Health owns a considerable number of insulated shipping cases and bottles which are used for the collection and shipment of samples. These are sent by express, properly sealed, to the collector, who after collection of samples packs them with ice, seals and returns them to the laboratory by express, charges collect. The collector is usually the local water superintendent or the health officer, who is carefully instructed in the matter.

This system fits very satisfactorily into our extensive territory where the visiting of supplies is attended by considerable expense. The local collectors cooperate excellently so that little delay due to their failure to collect is experienced.

For the sealing, a self-locking tin seal is used on which is stamped the name of the State Board of Health, and a number for identification.

The following tabulation gives the amount of laboratory work done by this Division during the past two years. There is an increase in the chemical analysis of private water supplies, due to our taking over this work, previously done at the State College in Bozeman. The increase over the previous biennial in this item does not appear to be great, due to the short time we have done this class of work. This work is increasing, however, and the next biennium is sure to show a much greater increase.

LABORATORY ACTIVITY, WATER AND SEWAGE DIVISION

Period, Nov. 1, 1926, to Oct. 31, 1928.

	Bacterial	Chemical
City Water Supplies.....	5634	58
Private Water Supplies.....	533	146
Miscellaneous Sources	472	76
	<hr/> 6639	<hr/> 280
Total of all samples.....	6919	
Previous Biennial Period.....	6540	

Field Inspections

Practically all field work is done by railway travel since the water supplies and sewage disposal systems are in towns touched by the railroads. It is the intention and endeavor of this division to see each supply once a year and the larger, and especially the purification plants, oftener.

When in a given city, private water supplies, swimming pools, ice fields and tourist camps are visited in addition to the public structures. It is our wish to do more rural work, but funds are limited.

In 1917 the law providing for regular inspections and analyses of public water supplies was passed and the work started in July. Under this law the State Board of Health is given authority to assess a fee against each city or town having a supply. The following schedule was put into effect:

Source of water supply—

Ground—(springs and wells)

Population	Annual Fee	No. of such in Montana
Under 500	\$12.50	17
500—1,000	20.00	14
1,000—2,000	25.00	8
2,000—3,000	30.00	3
3,000—5,000	35.00	0
5 000—15,000	40.00	3
15,000 and up	50.00	0

Surface—(streams, lakes)

	\$	
Under 1,500	30.00	28
1,500—3,000	50.00	6
3,000—6,000	90.00	4
6,000—10,000	100.00	2
10,000 and above	150.00	6

These fees have brought to the general fund approximately \$3600.00 a year. This money is appropriated by the Legislature for the use of the Division. While this is not adequate to finance the Division in all its activities, it has been of material assistance. It has made possible a regular schedule of inspections and laboratory analyses which has had a marked effect in bringing our supplies to their present quite satisfactory sanitary condition. There is scarcely a public water supply but has been improved during the past eleven years. Twenty-two liquid chlorine

plants have been installed and in twenty-nine communities new installations have improved or augmented the water supplies or brought into them an entirely new supply. As an additional benefit to these various cities and towns, improved methods of treating water and disposing of wastes have been inaugurated.

While not all of this work can be directly attributed to the activities of the State Board of Health, it is evident that the work carried on under this law has been productive of greatly improved conditions.

In striking correspondence with this improvement in sanitary conditions, has been our decrease in deaths from typhoid fever. In 1910 the rate was 39.8 per 100,000 population; in 1917, 15.7 and 1927, 2.7. Since 1918 we have had lower rates than those prevailing in the Registration Area.

The ninth biennial report (1917-1918) divided all the public water supplies into six classes. Forty-seven supplies in the first two classes are definitely approved, and one supply in the sixth class was definitely "unapproved." The remaining forty-one listed were not definitely approved nor were they unapproved pending further investigations or further improvements in the physical plant.

Comparing the same supplies, today there are but five which would still be classed as of doubtful sanitary condition, although in some others further improvements in physical equipment and general situation could well be made. However, safeguards against water borne diseases have been set up and by the same standards as used ten years ago the majority of supplies would now be on an "approved" list.

Not so satisfactory is the present condition as regards the chemical quality of the public supplies. A recent tabulation of the chemical analyses made shows a considerable proportion of waters in the undesirable classes as far as incrusting solids is concerned. This feature is of importance to the house owner and housewife since plumbing maintenance, laundry and general housework is affected. The tabulation shows as follows:

*Class	Scaling Constituents Grains Per Gallon	No. Montana Cities Having Water In This Class	Remarks
Very Bad Almost useless in the raw state and softening attended by the formation of excessive foaming constituents.	40 and above	4	Ground waters.
Bad Treatment before use imperative.	25 to 40	8	
Poor Use attended by formation of much scale. Softening advisable.	12 to 25	38	Seven of these will fluctuate thru rather wide limits.
Fair May be used without treatment if the boiler is cleaned regularly. Improved by softening.	5 to 12	34	Six of these will fluctuate thru rather wide limits.
Good Unlikely to cause excessive formation of scale.	0 to 5	19	Four of these will fluctuate thru rather wide limits.

* United States Geological Survey, Water Supply Paper No. 375.

At the present time there are:

- 10 liquid chlorine plants in filtration plants
- 19 liquid chlorine plants on other supplies
- 3 hypochlorite disinfection plants

but nowhere is anything being done to improve the chemical quality of the water.

The emergency chlorine plant available from our office has been called into use three times to avert possible epidemics because of unusual contamination of water or failure of the equipment regularly installed. It was set up for this purpose in Big Sandy, Columbus and Deer Lodge. Once it was used as an experiment with "prechlorination" of a water supply, and once on a sewage treatment trial. We are in need of a more up-to-date and flexible plant and one has been promised us by the Wallace-Tiernan Company.

Tabulation of Field Work for Past Biennium.

Field Inspections.

Water and Sewage Division.

Period Nov. 1, 1926, to Oct. 31, 1928.

Investigations

Public water supplies.....	181
Private water supplies.....	45
Sewage disposal systems.....	80
Schools	7
Miscellaneous	70
TOTAL	383

Treatment of Cistern Waters.

In certain parts of the state the well waters are not of good chemical quality and waters from contaminated streams are stored in cisterns. Satisfactory means of treating such water has been found in the use of chlorinated lime, the dosage being controlled by means of the ortho-tolidin test. A leaflet on this subject has been prepared and is available for free distribution.

Cross Connections.

The last (13th) biennial report referred to the regulations passed by the State Board of Health concerning cross connections. These are given herewith to show the stand taken toward them:

Cross connections: (a) A cross connection is herewith defined as a physical arrangement whereby a public water supply system is connected with another water supply system, either public or private, in such a manner that a flow of water into the public water supply system from such other water supply system is possible.

(b) Hereafter no plans for the construction of a public water supply system containing provisions for cross connections as defined above,

shall be approved by the State Board of Health; providing that the secondary supply is of unsatisfactory quality and will endanger the purity of the public supply.

(c) Beginning from the date of the adoption of this rule, cities and towns in which there exist cross connections as above defined, shall take such steps as are necessary to eliminate cross connections by July 1, 1927.

Since passage of these all cases brought to our attention have been remedied with one exception and that is in the process of correction. Those found have been remedied as follows:

Five have been removed.

Three auxiliary supplies have been chlorinated.

Three "overhead" discharge pipes have been installed.

One was provided with a "bleeder" line to relieve the pressure on the auxiliary supply.

One is to be removed.

Authorities responsible for these situations have responded in a very satisfactory way, and no trouble has been experienced in obtaining desirable changes.

Certification of Water Supplies Furnished by Common Carriers.

This work is carried on in co-operation with the U. S. Public Health Service. We are able to certify to all except two. In one of these a cross connection is to be removed after which certification is to be given.

33	supplies certified as satisfactory
1	supply not satisfactory unless improved
	by the end of the year
1	supply to be certified as stated above

TOTAL	35 Supplies.
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Sanitation at State Fair Grounds.

It is the custom of the State Board of Health, with the county health officer, to inspect each year the sanitary conditions at the State Fair Grounds during the State Fair. Invariably each year unsatisfactory conditions are observed as regards the disposal of sanitary sewage, because of the obsolete and inadequate facilities which are provided. This year (1928) a strenuous attempt was made to convince the State Fair Board that some permanent improvements should be installed, but the Chairman insisted that it was too late in the season to allot any money for the purpose. He agreed that if definite plans were drawn up for relief of the situation, he would go before the Legislature with a budget for the purpose. At a meeting of the State Fair Board, held the last day of the Fair at which Dr. Jordan and Mr. Foote were present, this Board went on record as favoring the appropriation of funds sufficient for the adequate provision for sewage disposal.

Following this meeting, the services of the State Engineer for the Carey Land Act Board were engaged, and he and Mr. Foote spent three days making surveys and drawing plans for the minimum which should

be built. An estimate of the cost has been placed at \$7,500.00, an amount which should be adequate to lay two main collecting pipelines and one main outfall line, a septic tank, and the installation of plumbing in the toilets adjacent to the grandstand, in the Agricultural Hall, Administration Hall, Administration Office, the connecting of the men's toilet on the west by the barns, and the women's toilet on the east side back of the grandstand.

If this program is followed out it will constitute a distinct step toward the permanent solution of the sanitary problems existing, and will be distinctly appropriate for the State in setting an example in the proper disposal of sewage.

Sewage Treatment Experiments.

Experiments with chlorination conducted in the fall of 1927 on the domestic sewage from the city of Havre were productive of interesting results and doubtless will assist us in arriving at a satisfactory adjustment of the Milk river pollution problem. A bond issue election was authorized in the spring of 1928, at Havre, the money thus made available to be expended in the building of a suitable collecting and treating system for that city. This issue, however, was defeated, the taxpayers feeling, apparently, that the cost was too high. As long as the citizens of Havre take this attitude it seems necessary to evolve some other plan which will be less expensive and the chlorination experiments were directed toward that end. More study is necessary before an adequate treatment will be found which will meet with the approval of the property owners.

New Work.

Plans for six new water supplies, six sewage systems, and forty-six school buildings have been approved during the past two years. This shows an increase in building over the previous period.

There is an evident need for improved methods of disposing of sewage in many of our communities. In fact the question of sanitation in our smaller towns has not been satisfactorily solved. It is doubtful if any one plan can be made applicable to all situations, but each one must be studied separately and solved in a manner as best suits the various conditions existing.

BIENNIAL REPORT—HYGIENIC LABORATORY 1927-1928 (ending Oct. 31)

Fred Stimpert, Director

The Hygienic Laboratory maintains a laboratory service in the diagnosis of disease for the people of Montana, through their physicians. The value and greatness of this service cannot be estimated in a greater way than in the realization of the increasing demands and number of examinations made during the last two years. There has been an increase of 5,837 examinations made over the same period of 1925 and 1926. The total number being 31,813, which means an average of 55 examinations a day. If this work should be estimated on a commercial basis at the minimum rate the value would be over \$130,000. Since there is no fee charged for any of the work this service is given free to the people of the State. The laboratory serves the people in practically every portion of the State and receives specimens from over 490 physicians who are now using the State laboratory. By close observation of the advances in Public Health work and laboratory diagnosis the laboratory has satisfied the demands for new and special examinations. Consequently several new procedures have been worked out and are now being done in routine form.

The quantity of the work, however, has not been the only consideration as the laboratory force has continually strived to improve the service. During the past year a complete new set of history and report blanks were adopted. These were made in different color for each type of specimen and all were standardized according to size. This has facilitated greatly the filing of reports as well as giving clearer and more information to the physician. A complete copy of all the methods and procedures used in the routine work of the laboratory is being compiled so that all the tests will be done according to a standard method. This will not only save much time, but will assure greater accuracy in the performance of the tests.

During the latter part of 1927 considerable change was made in the method of procedure for the Wassermann test for syphilis, with great satisfaction. A new antigen and a longer incubation time is now also used which has shown to give more definite readings. A satisfactory change was also made in the Widal test for typhoid.

The new laboratory methods for the diagnosis of Tularemia and Undulant Fever have been investigated and tried in the past year and a suitable test for application to this laboratory has been worked out and established as one of our regular procedures. It is the plan in the future to attempt to test all of the negative Typhoid bloods for Undulant Fever.

A study of Staphylococcus antivirus solutions has been made with considerable interest. Several samples were given to physicians for trial in its therapeutic application in cases of boils. Results sufficient for additional interest were derived.

At the present time experimental work is being carried on with a complement fixation test for Tuberculosis. A number of tests have been completed with good results and the histories of the cases are being investigated for further study. Since this test is yet new in practical routine diagnosis the adoption as a regular procedure by many prominent foreign laboratories and the larger laboratories in this country shows that it has many possibilities and will no doubt soon be as reliable as the Wassermann test for Syphilis.

The following field work and investigations by laboratory procedures have been completed by the Hygienic Laboratory:

August 22, 1927—Epidemic of Diphtheria at Fraser, Mont. There were over ten families with cases. All the families were investigated as well as all possible contacts and 42 throat cultures were taken. Results of cultures showed 20 positives, most of whom were carriers. Immunization of the entire community was suggested. No cases have been reported during 1928.

October, 1927—Analysis of canned corn from family at Plevna, Mont., where several deaths occurred, believed by attending physicians to be from botulism. Five guinea pigs were inoculated with fluid from the corn and three showed definite symptoms and post-mortem characteristics of death due to toxin of *Clos. botulinum*. Smears and cultures were made and showed organisms of *Clos. botulinum* character.

November, 1927—Experimental work done on blood and urine from cases of infectious Jaundice which occurred in an epidemic form at Terry, Mont. Ten specimens were cultured for *Leptospira icterohemorrhagiae* and injected into guinea pigs. Three guinea pigs showed typical jaundice.

September, 1928—Investigation of Typhoid situation at Libby, Mont. Laboratory equipment taken to Libby and the following examinations made: 50 samples of water showing eleven surrounding streams polluted, city water good; 130 specimens of feces of food handlers showing eight to be Typhoid carriers; 32 histories collected on previous cases.

An interesting collection of data on the reports of laboratory tests for the diagnosis of Syphilis and Gonorrhea was compiled for three counties—Lewis and Clark, Cascade and Silver Bow. These figures are only on the tests done by the State Laboratory:

		SYPHILIS		GONORRHEA	
		Positive	Total	Positive	Total
Lewis and Clark County	1925-26-27.....	197	1866	95	600
Cascade County	1925-26-27.....	222	1287	6	36
Silver Bow County	1925-26-27.....	886	5464	1	7
		1305	8618	102	643

HYGIENIC LABORATORY REPORT OF LABORATORY EXAMINATIONS

1927-1928

	1927	1928	
BLOOD EXAMINATIONS		Jan. to Nov.	
Syphilis, Wasserman reaction.....	8862		8916
Pos.	1151	1245	
Neg.	7468	7298	
Unsat.	243	373	
Gonorrhea, Complement Fixation test.....	40		54
Pos.	4	9	
Neg.	34	42	
Unsat.	2	3	
Typhoid, Widal reaction.....	899		927
Pos.	41	75	
Neg.	236	196	
Doubt	22	29	
Unsat.	2	8	
Tularemia Agglutination Test.....	4		15
Pos.		3	
Neg.	4	11	
Unsat.		1	
Undulant Fever, agglutination test.....			2
Pos.			
Neg.		1	
Unsat.		1	
Tuberculosis, Complement Fixation test..			2
Pos.		1	
Neg.		1	
Blood Cultures, organisms.....	22		24
Blood Smears, Malaria.....	3		3
Blood Sugar.....	53		22
Blood Grouping.....	4		9
Blood Counts.....	103		95
Coagulation	20		3
SPINAL FLUID EXAMINATIONS			
Wassermann	227		166
Pos.	64	46	
Neg.	148	97	
Unsat.	15	23	
Colloidal Gold	158		87
Pos.	34	16	
Neg.	122	71	
Unsat.	2		
Chemical	2		52
Cell Count	6		14
Bacteriological	85		31
Pos.	18	12	
Neg.	15	10	
Susp.	11	1	
THROAT CULTURES			
Diphtheria	1598		1623
Pos.	256	403	
Neg.	1190	1046	
Susp.	146	156	
Unsat.	4	18	

HYGIENIC LABORATORY REPORT OF LABORATORY EXAMINATIONS 1927-1928—(Continued)

	1927	1928 Jan. to Nov.
Hemolytic Streptococci.....	1655	457
Pos.	708	191
Neg.	920	261
Susp.	21	3
Unsat.	6	2
Pneumococci	1	
Pos.	1	
Neg.		
Unsat.		
Meningococci	991	32
Pos.	224	1
Neg.	763	23
Unsat.	4	8
Other Organisms.....	78	52
SMEARS, SLIDE EXAMINATIONS		
Gonorrhea	711	542
Pos.	224	178
Neg.	486	361
Unsat.	1	3
Vincent's Angina.....	50	68
Pos.	21	22
Neg.	29	12
Miscellaneous	148	76
SPUTUM EXAMINATIONS		
B. tuberculosis	562	661
Pos.	67	108
Neg.	493	541
Unsat.	2	12
Miscellaneous		6
TRANSUDATE AND EXUDATE EXAMINATIONS		
Bacteriological	26	18
Chemical		
Animal inoculations.....	2	6
FECES EXAMINATIONS		
B. typhosus.....	63	212
Pos.	21	15
Neg.	17	196
Unsat.		1
B. paratyphosus A.....	21	176
Pos.		
Neg.	21	176
B. paratyphosus B.....	21	176
Neg.	21	176
Pos.		
Parasites	23	8
Miscellaneous		2
URINE EXAMINATIONS		
Microscopical	179	126
Chemical	182	128

HYGIENIC LABORATORY REPORT OF LABORATORY EXAMINATIONS 1927-1928—(Continued)

	1927	1928 Jan. to Nov.
Bacteriological	55	21
Animal Inoculations	9	16
Human milk examinations	23	18
Unclassified examinations	44	2
Autogenous Vaccines	35	58

TOTAL	16,965	14,848
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GRAND TOTAL	31,813
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Total Containers Distributed	25,080
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	1927	1928
Wassermann	7484	6673
Widals	121	273
Tuberculosis	640	737
Diphtheria	2870	5216
Gonorrhea	430	503
Feces	4	111
Urine	14	

TOTAL	11,567	13,513
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REPORT OF THE FOOD AND DRUG DIVISION

Glenn D. Wiles, Director, Helena

The Food and Drug Division has, as its chief activity, the enforcement of the Food and Drug Law and State regulations governing the sale of foods and drugs, and the operation of food handling establishments. Few things are as important to us as pure foods and potent drugs. While the greater amount of foods and drugs sold in the state is of high quality, constant vigilance is required to keep the smaller percentage of adulterated, decomposed and misbranded foods and drugs at a minimum. The tendency to adulterate or misbrand foods is much less when the food manufacturer and dealer knows that a strict watch is being kept over the products he puts on the market.

The activities of the Food and Drug Division may be briefly summarized as follows:

1. Enforce the provisions of the Pure Foods and Drugs Act of 1911 relative to adulterated and misbranded foods and drugs.
2. Make laboratory analysis of foods and drugs to determine whether or not they are adulterated or misbranded.
3. Issue licenses to food manufacturing and handling establishments as required by law.
4. Enforce sanitary regulations governing food handling establishments.
5. Cooperate with local and county health officers in making regular sanitary inspection of food handling establishments, and the collection of food samples for laboratory analysis.

Licenses

A separate license is required for each of the classes of business listed below:

1. Public eating places.
2. Meat markets.
3. Manufacturing bakeries.
4. Manufacturing confectioneries.
5. Soda fountains, ice cream parlors and soft drink establishments.
6. Canneries.
7. Bottling works.

Licenses are secured upon application to the State Board of Health by making payment of the fee of two dollars. All licenses expire on December thirty-first of the year issued. Fees are turned into the State

Treasurer and placed in the general fund. Since the enactment of the license provision of the law in 1921 the following licenses have been issued and corresponding fees collected:

Licenses in 1922, 2974—Fees collected.....	\$ 5,948.00
Licenses in 1923, 3064—Fees collected.....	6,128.00
Licenses in 1924, 2923—Fees collected.....	5,846.00
Licenses in 1925, 3128—Fees collected.....	6,256.00
Licenses in 1926, 3460—Fees collected.....	6,920.00
Licenses in 1927, 3868—Fees collected.....	7,736.00
Licenses in 1928,	
(to Nov. 1) 4071—Fees collected.....	8,142.00
Total collected for licenses during past	<hr/>
eight years.....	\$46,976.00

Every effort is made to keep all manufacturers and purveyors of foods fully informed regarding the State Laws and Regulations. Approximately 11,000 copies of regulations have been sent to licensed food establishments. In addition to this, 10,000 form letters were sent calling attention to specific regulations which were not being observed. Local health officers and inspectors are kept informed of particular laws or regulations which should be watched more closely. Of special interest is the large number of requests received for copies of food and drug laws, rules and regulations from food manufacturers outside of the state.

Inspections

Inspections of food handling establishments are carried on chiefly by local city and county health officers or inspectors working under their supervision. State regulations require monthly inspection of all food handling establishments by local health officers, inspection blanks being furnished by the state department. These blanks, after being filled out and signed are returned to the state office where they are checked over and orders are given to correct any gross insanitary condition. Health officers are credited with the number of score cards properly filled out and returned to this office. Doubtless many inspections are made where the cards are not submitted to the department, hence the total number of inspections made is greater than listed below.

Local and county health officers, during the biennial period turned in inspection blanks covering 21,127 food establishments. During the same period 5,506 inspections were made of food establishments by representatives of the Food and Drug Division. In order to maintain close cooperation with county and city health officers it is the aim of the Food and Drug Division to make at least one inspection of all licensed places in the state each year. Insofar as funds will permit, this has been done.

Prosecutions

It is not the practice of the State Board of Health to prosecute every violation of the pure food law or regulations. Violations are frequently not intentional and the party is warned to comply with the law in many instances.

During the past biennial period proceedings were instituted against the following parties for violation of the Food and Drug Act:

Olive Burlingame.....	Ryegate	Failure to take out license
Tom Cunningham.....	Miles City.....	Failure to take out license
J. K. Cunningham.....	Miles City.....	Failure to take out license
Paul Schultz.....	Lewistown.....	Failure to take out license
John Giuntoni.....	Red Lodge.....	Failure to take out license
Joe Lague.....	Anaconda.....	Failure to take out license
Richard Hart.....	Ronan.....	Failure to take out license
Thomas Butler.....	Miles City.....	Failure to take out license
Borra Meat Market.....	Black Eagle.....	Adulterated hamburger
Otto Kretzer.....	Anaconda.....	Adulterated hamburger
J. P. Allen.....	Missoula.....	Adulterated hamburger
Opitz & Granger.....	Missoula.....	Adulterated hamburger
F. A. Still.....	Missoula.....	Adulterated hamburger
Roy Page.....	Great Falls.....	Failure to take out license
Michael Nettik.....	Lewistown.....	Adulterated hamburger
John Kastelitz.....	Bear Creek.....	Adulterated hamburger
John Kopp, Jr.....	Bozeman.....	Adulterated hamburger
Nick Vlinker.....	Choteau.....	Adulterated hamburger
Frank Gooch.....	Great Falls.....	Adulterated hamburger
Theo. Dullum.....	Great Falls.....	Adulterated hamburger
Tony Autonich.....	Black Eagle.....	Adulterated hamburger
A. L. Anderson.....	Dillon.....	Adulterated hamburger
Hale & Bry.....	Dillon.....	Adulterated hamburger
B. M. Rouchetta.....	Butte.....	Adulterated hamburger
L. E. Hiatt.....	Rexford.....	Adulterated hamburger
Sturm & Drake.....	Billings.....	Adulterated hamburger
Bestwich Bros.....	Alberton.....	Adulterated hamburger
E. C. Nelson.....	Troy.....	Adulterated hamburger
Geo. H. Goering.....	Polson.....	Adulterated hamburger

It is of interest to know that no case has been contested in the courts during the two-year period. Fines collected are turned into the general fund as required by law.

Licenses Cancelled

The Secretary of the State Board of Health is authorized to cancel licenses of food handling establishments if parties fail to maintain reasonable sanitary conditions. Acting under this authority the following licenses were revoked by the Secretary of the Board:

W. A. Cooper.....	Lunch counter.....	Carlyle
W. S. Pray.....	Restaurant.....	Paradise
Mrs. J. W. Cook.....	Restaurant.....	Chester

Food and Drug Laboratory Report

The laboratory work of the Food and Drug Division is not as extensive as it should be to keep a close check on foods manufactured and sold in the State. With the exception of three months in the biennial period, all of the food and drug laboratory work was done by the Director of the Food and Drug Division, along with the many other duties connected with enforcing the law. This permitted only a partial check on foods sold in the State, and comparatively little work on the analysis of drugs. On June 15, 1928, a chemist was employed in the Food and Drug

laboratory for a period of three months. The results of the close check in foods and drugs being sold for this three months period showed clearly the necessity of employing a full-time chemist to more effectively enforce the Pure Food and Drug Law. Fifteen prosecutions were filed in this three months period while only five additional cases were filed for food adulterations during the biennial period.

The laboratory samples examined are summarized as follows:

Total samples analyzed.....	1401
Samples classified as passed	1045 or 74.6%
Samples classified as not passed	356 or 25.4%

As noted above, approximately 25% of the samples examined were classified as not passed because of adulterations or misbranding. Those of a more serious nature, such as the adulteration of hamburger with an illegal preservative, were prosecuted. Others were given warnings to bring their products up to a proper standard. The percentage of samples reported as "not passed" does not mean that that proportion of foods sold on the market is below standard. Samples collected for laboratory analysis are picked as being suspicious, or as being a variety of food on which a systematic check is being made.

Particular attention is given to foods manufactured in the State. Some of the foods manufactured in the State on which regular examination is made are as follows: Lard, wieners, hamburger, salad dressing, sandwich spread, orange marmalade, honey, vinegar, soft drinks, canned cherries, canned peas, canned corn, canned pumpkin, canned string beans, canned sauerkraut, canned tomatoes and horseradish.

In addition to the above laboratory work of the Food and Drug Division an arrangement has been made to analyze all samples of butter, cheese and ice cream collected by the Dairy Division, State Department of Agriculture, to aid them in the enforcement of their law.

The field inspection work is of great importance, both to the food purveyor and to the general public. The Director of the Food and Drug Division endeavors to aid inspection by cooperating with local officials in making inspections, checking up on state licenses and collecting food samples for laboratory analysis. Grocery stores and wholesale houses are not licensed, but frequent inspections are made in these establishments where questions such as the disposal of swelled canned goods and the protection of foods are discussed.

Drug Inspection

Having no funds appropriated for drug control work, comparatively little has been done along this line. However, during the biennial period, 125 drug stores were visited and inspections made of the storage of biological supplies, such as vaccines and serums. Only 33 stores visited, or approximately 26%, maintained what could be called unquestionable satisfactory storage. Storage in these cases consisted of ice boxes, soda fountains or mechanical refrigeration. Many drug stores relied on base-

ment storage where temperatures are variable and there was some question about the proper temperature being maintained at all times.

Proper storage was discussed with the proprietors of drug stores and they were advised to provide conditions which would conform with accepted trade practice. Generally speaking, biological supplies should be stored at temperatures above freezing, and below 50 degrees F., with the exception of smallpox virus, which should be kept at or near the freezing point. For the general supply of biologicals a temperature up to 60 degrees F. is not to be considered particularly harmful. It has been our observation that suitable temperatures cannot be maintained at all times except with some sort of refrigeration. This investigation will be continued during the coming year, insofar as funds and time permit.

Tourist Camps

With the rapid improvement in highways in Montana and the resulting growth in tourist travel, the question of tourist camp sanitation is becoming one of increasing importance. The tourist, a visitor to our State, has the right to enjoy clean, sanitary camp grounds, with an adequate supply of pure water, proper toilet facilities and satisfactory garbage and refuse disposal. In conjunction with the water and sewage division, investigations have been made of fifty-five tourist camps during the past eight months period. Conditions found in some of these camps were far from satisfactory, and it is apparent that some sort of systematic inspection and control must be worked out. After making a study of conditions in the State it is recommended that adequate legislation be passed giving the State Board of Health power to license and regulate tourist camps and similar public places.

Spring Clean-up

In order to stimulate spring clean-up activities, especially in the small towns and rural communities, a special Spring Clean-up bulletin has been printed and widely distributed throughout the State. This bulletin not only advises spring clean-up, but also touches on many questions pertaining to sanitation. Some of the subjects discussed are: the control of the house fly, mosquito control, garbage disposal, food sanitation, water supply, sewage disposal and tourist camp sanitation.

Federal Cooperation

The Montana Pure Food Law is patterned after the Federal Food and Drug Act. However, the State law pertains only to food products sold in the State. Interstate shipments of foods or drugs which are considered adulterated or misbranded may be withheld from sale in the State, but the producer or manufacturer, if outside the State, cannot be held accountable except under federal law. The Food and Drug Division is deeply indebted to the Food, Drug and Insecticide Administration, U. S. Department of Agriculture, for the cooperation and assistance offered us in carrying on our work regarding food and drug products suspected of being illegal, and we are also kept informed about shipments of sus-

pected products entering the state. Samples are frequently collected at the request of the Federal administration, and interstate shipments are withheld from sale until suitable action can be taken. During the past biennial period the following shipments have been handled through co-operation with this department:

1	car apples.....	arsenically sprayed.....	Great Falls
11	cases syrup.....	adulterated and misbranded.....	Anaconda
47,100	lbs. stock tonic.....	fraudulent therapeutic claims.....	Lewistown
1	shipment compound fruit.....	laxative, fraudulent claims.....	Butte
25	cases dried figs.....	wormy	Butte
25	cases cooking figs.....	wormy	Helena
25	lbs. imported figs.....	wormy	Helena
115	cases figs.....	wormy	Havre
757	cases figs.....	wormy	Butte
1	car cereal.....	weevil infested.....	Billings
75	cases dried figs.....	wormy	Missoula
1	car apples.....	misbranded	Laurel
24	cases fig bars.....	wormy	Helena
1	shipment fig bars.....	wormy	Kalispell
1	shipment fig bars.....	wormy	Red Lodge
1	car cotton seed cake.....	deficient in protein.....	W. Sul. Springs

Hotel Inspection

The State hotel law requires an annual inspection of hotels by local health officers. Copies of State laws and regulations are furnished for distribution along with inspection blanks for health officers' inspections. During the past biennial period, 562 hotel inspections were reported to this office by local health officers. Particular stress is laid on cleanliness of bedding, length of sheets, ventilation and fire escapes. The State Fire Marshal is furnished with lists of hotels having inadequate fire escape facilities so that he may make further investigation.

Food Poisoning

Food poisoning resulting from eating commercially prepared foods is rarely encountered. We have no evidence of illness being caused by the consumption of foods of this kind during the last two years. One outbreak of Botulinus poisoning occurred at Plevna, Montana, in 1927, resulting in the death of a mother and three children. Home canned corn, presumably not properly sterilized at the time it was canned, was suspected of being the source of the infection. Samples collected and examined in the State laboratory revealed large numbers of clostridium Botulinum organisms, confirming the belief that the trouble was caused by home canned corn. Examples of this kind should be a warning to those who can fruits and vegetables at home, to be sure that foods are properly sterilized when packed. Canned fruits and vegetables should be closely examined when jars are opened and all cans showing signs of fermentation or decomposition should be destroyed. As an additional precaution, boiling for 15 minutes will also kill most bacteria and destroy the toxin of Botulinus bacteria if it happens to be present.

Conclusion

The Food and Drug Division is more than self-supporting, in that more money is turned in to the State Treasurer for licenses issued than is expended by the Division. It is hoped that the legislature will see the wisdom of appropriating a sum of money at least equal to the amount collected for licenses so that more efficient work can be carried on. It is conservatively estimated that food valued at \$70,000,000 is consumed in Montana annually. Over one-half million people are more or less directly concerned with the enforcement of the pure food laws and regulations. As shown by licenses issued, there is a steady increase in the number of food manufacturing and food handling establishments. The amount of laboratory and field work necessary to properly regulate these businesses is increasing proportionately.



